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71 Applicant: **Bertoletti, Giovanni**  
**Via Mazzini, 5**  
**I-25036 Palazzolo sull'Oglio (Brescia)(IT)**

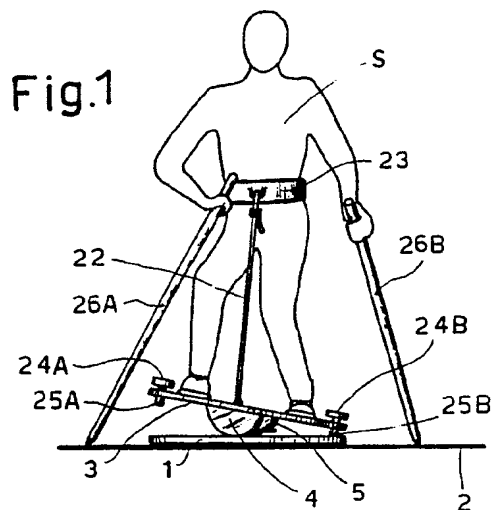
72 Inventor: **Bertoletti, Giovanni**  
**Via Mazzini, 5**  
**I-25036 Palazzolo sull'Oglio (Brescia)(IT)**

74 Representative: **Luksch, Giorgio, Dr.-Ing. et al**  
**Ing. A. Giambrocono & C. S.r.l. Via Rosolino**  
**Pilo, 19/b**  
**I-20129 Milano(IT)**

54 **Inclinable rotary platform for physical training, particularly of pre-ski type.**

57 This apparatus for physical training, particularly of pre-ski type, is characterised by a base for its resting on the ground and engaged with an upper platform by means able to cause this latter to move angularly about a vertical axis as the result of a rocking movement about a horizontal axis imposed by the sportsman's feet bearing on said upper platform.

The apparatus is also characterised by a stout belt to be worn by the sportsman and used to anchor an elastic cable fixed to the upper platform, in order to compel the feet to undergo a reactive force.



# INCLINABLE ROTARY PLATFORM APPARATUS FOR PHYSICAL TRAINING, PARTICULARLY OF PRE-SKI TYPE

This invention relates to the field of physical training apparatus and particularly to apparatus for pre-ski use.

It is well known that certain sporting activities can be performed at a high level of athletic commitment only after preparative physical training for the purpose of tuning up the muscles and general body structure gradually. This is particularly necessary in skiing in which the violent and sudden stresses created by the snow-laden ground during descents impose considerable muscular reactions.

This athletic preparation becomes more effective the more gradual or prolonged it is, so that often it cannot be satisfactorily carried out in ski resorts because of the overwhelming temptations offered by the ski pistes themselves.

An object of the present invention is to provide a physical training apparatus which allows effective athletic preparation, particularly pre-ski preparation, even in the home or generally removed from ski resorts.

A further object is to provide an apparatus which is easily transported.

A further object is to provide an apparatus of great simplicity and strength.

A further object is to provide an apparatus having adjustable dynamic stimulus parameters.

These and further objects which will be apparent from a reading of the following detailed description are attained by an apparatus for physical training, particularly of pre-ski type, characterised by a base for its resting on the ground and engaged with an upper platform by means able to cause this latter to move angularly about a vertical axis as the result of a rocking movement about a horizontal axis imposed by the sportsman's feet bearing on said upper platform.

These engagement means between the base and the upper platform consist essentially of a pair of half-wheels, about the axis of which the upper platform is rigid and of which one is engaged by friction on the base and the other is rotationally independent of said base, so that as said half-wheels move angularly about their horizontal axis as the result of an inclination imposed on the upper platform by the feet, said half-wheels and thus the upper platform of which they form part are made to orbit about a vertical axis, only one of said half-wheels being torsionally engaged with the base.

This invention is illustrated by way of non-limiting example on the accompanying drawing in which:

Figure 1 shows a sportsman standing on the apparatus;

Figure 2 is a section through the middle of the apparatus.

With reference to Figure 1 and assuming both half-wheels 4 and 5 to be rigid with the platform 3 (ie as though they form a half cylinder) it is clear that the platform 3, which rests on said wheels such that they act as a fulcrum, is caused to rock to the right or left by the thrusts exerted by the feet of the sportsman S.

If instead of two wheels of horizontal axis only one wheel positioned offset from the vertical axis is used, then the assumed simple rocking is no longer possible. Under these conditions the advantageous combined movement is obtained which characterises the present invention.

This wheel, or half-wheel, is in fact caused in this manner to rock on the base not only about its own axis but also "with" its own axis, to orbit about a circumference of vertical axis.

The motion to which the platform 3 is subjected is conceptually similar to that of a half-cone of essentially horizontal axis which rolls on a cone having an essentially vertical axis which intersects the horizontal axis.

From a constructional viewpoint, rather than using orthogonal or skew cones, these platform movements can be obtained more economically using other methods, of which that of Figure 2 is one example.

A base 1' of preferably discoidal shape forms the support for a first flange 6 mounted on one or more rolling-contact bearings 7. The bearing 7 supports the weight of the sportsman S, and it must therefore be suitable to withstand axial loads. It could therefore be a radial ball bearing with deep races. On this first flange, which is mobile about a vertical axis 8, there rests a first half-wheel 5' rigid with a platform 3' and disposed in a plane 10 which is offset by a distance 9 from the axis 8.

In a position coaxial with its hub 6A the first flange 6 carries a fixed shaft 11 which is made rigid with the base 1' by fixing its edge 11A with screws 12.

A second flange 14 is fixed onto said shaft by usual means, such as a screw 13. Said second flange is above the first flange 6 and is not in contact with it. The fixed shaft 11 is distanced from the bore of the hub 6A of the first flange by a suitable clearance.

A second half-wheel 4' smaller than the half-wheel 5' rests on the second flange 14.

The second half-wheel 4' is also rigid with the platform 3', but indirectly.

In this respect, it is provided with a slide 28 slidable radially in a guide 27 rigid with the platform 3' and its degree of offset 15 from the vertical axis is adjustable by screwing a screw 16 into or out of a lead nut 17 rigid with the platform 3'. Said screw 16 is provided with an operating knob 18 and usual means 16A for shifting the second half-wheel 4' mounted on the slide 28. In the top 11B of the fixed shaft 11 there is provided a bore 11C in which a shank 19 is slidable, and is fixed to the platform 3' by a transverse pin 20 of axis 21.

The axis 21 of this pin represents the horizontal rocking axis of the platform 3'. On a head part 19A of the shank there is provided a ring 19B for fixing an elastic cable 22 hooked to a stout belt 23 tightened about the hips of the sportsman S. The purpose of this elastic cable is to cause a preload to act on the sportsman's legs and so stimulate their muscles.

This preload is adjustable by varying the length of the elastic cable used. This adjustment can be done by various known means. By way of example, a "cable throttler" can be adopted, of the type commonly used in the nautical field and generally based on the use of a unidirectional self-wedging pawl which can be disengaged on command.

The platform 3 (3') is provided in a peripheral position with knobs 24A and 24B the threaded ends of which form, on the lower side of the platform through which they are screwed, projections 25A and 25B which strike the base 1 to limit the angular amplitude of the rocking movement.

From the foregoing it is apparent that if the sportsman S presses with one foot more than the other he causes the platform 3 (3') to rock and simultaneously rotate about itself, so subjecting the sportsman's body to twisting action against which he reacts by acting on the ground with sticks 26A and 26B. As his feet rest on a surface undergoing rocking movement with variable inclination in space, they transmit throughout his body stimulating reactions as he restores his equilibrium.

This facility for simultaneous rotation and inclination of the platform derives from the fact that of the pair of half-wheels 4' and 5', only one half-wheel (ie 4') is able to transmit propulsive forces to the base 1, (1') (second flange 14).

In this respect, the other half-wheel by resting on the first flange 6 provided with the bearings 7 receives practically no reaction. This fact means that the apparatus according to the invention could also be formed in other ways, such as by means of a wheel rotating idly about its axis and resting directly on the fixed base (replacing for example the half-wheel 5' and the first flange 6), without leaving the scope of the invention.

Conventional arrangements are used in all cases to increase the friction between the elements

in engagement between the base 1 and platform 3. By way of example, with reference to the embodiment of Figure 2, the second flange 14 has its upper surface covered with rubber, on which the half-wheel 4' can roll without slipping. Another friction-creating surface is the upper surface of the platform. In this case the friction acts on the feet resting on it and is obtainable in various ways. For example, the surface can comprise projections extending parallel to the length of the feet to prevent transverse sliding. The position to be taken by the feet on the platform can be identified by the parallel lines formed by said projections, but can be more advantageously defined by suitable designs indicating two feet in plan view, and within which the sportsman S is to place his feet.

The effect of radially adjusting the position of the half-wheel 4' is apparent from Figure 2.

From this it can be seen that the greater the offset 15, the smaller is the angle through which the half-wheel 4' moves as its semi-circumference moves through the corresponding arc on the second flange 14.

## Claims

1. An apparatus for physical training, particularly of pre-ski type, characterised by a base (1, 1') for its resting on the ground (2) and engaged with an upper platform (3, 3') by means (11C, 19, 5', 6, 4', 14) able to cause this latter to move angularly about a vertical axis (8) as the result of a rocking movement about a horizontal axis (21) imposed by the feet of the sportsman (S) bearing on said upper platform (3, 3').

2. An apparatus as claimed in the preceding claim, characterised by comprising between the base (1, 1') and the upper platform (3, 3') engagement means consisting essentially of a pair of half-wheels (4-5, 4'-5'), about the axis (21) of which the upper platform (3, 3') is rigid, and of which one (4') is engaged by friction on the base (14-1') and the other (5') is rotationally independent (6) of said base (1'), so that as said half-wheels (4', 5') move angularly about their horizontal axis (21) as the result of an inclination imposed on the upper platform (3, 3') by the feet, said half-wheels (4', 5') and thus the upper platform (3, 3') of which they form part are made to orbit about a vertical axis (8), only one (4') of said half-wheels (4', 5') being torsionally engaged with the base (14-11, 1').

3. An apparatus as claimed in the preceding claims, characterised by a stout or robust belt (23) to be worn by the sportsman (S) and used to anchor an elastic cable (22) fixed to the upper platform (3), in order to compel the feet to undergo a reactive force.

4. An apparatus as claimed in claim 3 comprising an elastic cable (22), characterised by an arrangement for adjusting its length between the platform (3,3') and the belt (23).

5. An apparatus as claimed in claim 3 comprising an adjustment arrangement for the elastic cable (22), characterised in that this latter is unidirectionally retained by a device of the cable-throttling type formed by a pawl which is self-wedging in one direction only, and is removable to allow the sliding required for adjustment.

6. An apparatus as claimed in the preceding claims, characterised in that the lateral inclination is adjustable by the screw-adjustment of projections (25A, 25B) interposed between the base (1) and the platform (3), effected by specific knobs (24A, 24B).

7. An apparatus as claimed in the preceding claims, characterised in that the angular rocking about the vertical axis (8) is adjusted by varying the radial distance (15) to the point of contact between the drive half-wheel (4') and a fixed part (14) of the base (1).

8. An apparatus as claimed in claim 7 comprising radial distance variation, characterised in that this latter is effected by screw means.

9. An apparatus as claimed in claim 7 comprising adjustment of the radial distance (15) to the point of contact between the drive half-wheel (4') and a fixed part (14) of the base (1), characterised in that this adjustment is effected by moving a slide (28) by screwing a screw (16) operated by a knob (18) and assisted by a slide guide (27).

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